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It is found that the duration of life depends directly upon the humidity of the air, being greatest at one vapor pressure and least at another; but these points do not coincide for all kinds of pollen. There are only a few species which live longest in very moist air (90-60 per cent.), and only one that lives the same length of time in moist as in dry air; but there are many species which live longest in very dry air (30-0 per cent.). (A priori, it would seem that all pollen should remain alive longest in absolutely dry air, and one wonders whether the differences found by PFUNDT are not due to some other factors, for whose operation there is ample room in the handling of the material, and particularly in the artificial germination tests on which the conclusions are based.) In nature the duration of life is very variable because of the variations in the moisture of the air. The influence of a single change from moist to dry is not very evident, but repeated changes shorten life, and the drying of wet pollen leads quickly to death, the sooner the longer it was wet. Ecological adaptations are not clear; the pollen of early spring and late autumn flowers, however, is generally long-lived, shows little sensitiveness to moisture, and germinates at minimum temperatures, even below 4-5°. Whereas freshly gathered pollen may germinate in dilute or in concentrated solutions indifferently, that which is about to die produces tubes only in the most favorable concentration.—C. R. B.

**Morphology of *Salvinia*.**—ARNOLDI<sup>21</sup> has published the results of a study of *Salvinia natans*. The paper is divided into three parts: (1) the germination of the microspore and the development of the male gametophyte; (2) the germination of the megaspore and the development of the female gametophyte, fertilization, and embryo formation; (3) a series of experiments on the female gametophyte. In the first part little is added to BELAJEFF'S account except such cytological details as the size of nuclei and chromosomes, the number of chromosomes (4), and the spermatogenesis. The early stages of the female gametophyte were followed more closely than by previous authors. It is found to be composed of a coenocytic portion contained within the old spore wall, and an exposed chlorophyll-bearing tissue, one side of which bears archegonia. In the mature archegonium, the axial row consists of the egg, the ventral canal cell, and a broad wedge-shaped neck canal cell which is binucleate. In the third part of the paper the following facts are recorded: (1) an unsuccessful attempt to produce apogamous embryos; (2) the appearance of the archegonia in the upper or lighter side of the prothallium is not a response to light; (3) the development of the winglike appendages, characteristic of the female gametophyte of *Salvinia*, occur only when fertilization and embryo formation precede it; (4) the food material used by the developing embryos is not made by the chlorophyllose tissue of the gametophyte, but is that which was stored in the megaspore; (5) spores sown on damp clay germinated and produced good prothallia with normal archegonia and embryos.—WANDA M. PFEIFFER.

<sup>21</sup> ARNOLDI, W., Beiträge zur Morphologie der Keimung von *Salvinia natans*. Flora 100:121-139. figs. 47. 1909.